South Coast Rock Lobster TAC for the 2018/19 season

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Summary

The application of OMP-2014 results in a TAC of 321 MT for the 2018[1] season (a 5% decrease in TAC compared to that of 2017).

OMP-2014 TAC setting algorithm

Full details of the algorithm developed for setting the South Coast rock lobster TAC are available in Johnston and Butterworth (2016). In summary, the following equations apply:

$$TAC_{y+1} = TAC_y[1 + \alpha \frac{\overline{CPUE}_y - CPUE_{targ}}{CPUE_{targ}}] \quad (1)$$

where:

TAC_{y+1} is the TAC for the forthcoming season (2018 in this case),

TAC_y is the TAC from the previous season (i.e. *y*=2017),

$\overline{CPUE}_y$ is a measure of recent CPUE and is calculated as follows:

$$\overline{CPUE}_y = \frac{1}{3}\sum_{y'=y-3}^{y-1}\sum_{A=1}^{3}\lambda_A CPUE_{y'}^{A}, \quad (2)$$

where:

$CPUE_{y'}^{A}$ is the GLM standardized CPUE for area A in year y' (the values applicable to these calculations are as follows (Glazer, 2018)):

Year	Area 1E	Area 1W	Area 2+3
2014	1.41	1.41	1.27
2015	1.97	1.47	1.03
2016	1.62	1.21	0.96

λ_{1E}, λ_{A1W} and λ_{2+3} are CPUE weighting factors related to the proportion of the overall biomass in each of the three fishing areas (see Johnston and Butterworth (2016) for details), namely:

λ_{1E}=0.003

λ_{1W}=0.128

λ_{2+3}=0.868

[1] The year 2018, for example, refers to the 2018/19 fishing season

$CPUE_{targ}$ = 1.22 (the value for which the median *Bsp*(2015/2006)=1.30; the selected biomass recovery target for OMP-2014 under the Reference Case 1 operating model).

α is a tuning parameter that controls the responsiveness of the OMP to CPUE deviations from $CPUE_{targ}$ and for OMP-14 is set at 1.0.

A rule is applied to limit inter-annual TAC variation to no more than 5% in either direction (i.e. the TAC is limited to fluctuating between ±5% of the previous seasons TAC):

$$if\ TAC_{y+1} > 1.05TAC_y \quad \text{then} \quad TAC_{y+1} = 1.05TAC_y \tag{3}$$

$$if\ TAC_{y+1} < 0.95TAC_y \quad \text{then} \quad TAC_{y+1} = 0.95TAC_y \tag{4}$$

The 2018/19 TAC calculation

The application of the equations described above results in a TAC of 321 tons for the 2018 season:

$$\begin{aligned}\overline{CPUE}_{2017} &= \frac{1}{3}(0.003(1.41) + 0.128(1.41) + 0.868(1.27) + 0.003(1.97) + 0.128(1.47) \\ &\quad + 0.868(1.03) + 0.003(1.62) + 0.128(1.21) + 0.868(0.96)) \\ &= 1.123\end{aligned}$$

$$\begin{aligned}TAC_{2018} &= 338\left[1 + 1.0(\frac{1.123 - 1.22}{1.22})\right] \\ &= 338[1 - 0.07951] \\ &= 311 \text{ MT}\end{aligned}$$

This amounts to a 8% decrease in TAC from that of 2017 (338 tons). Since this decrease falls outside the lower 5% constraint related to TAC_{2017} the inter-annual TAC constraint must apply. The final TAC_{2017} value is thus:

$TAC_{2018} = 0.95\ TAC_{2017}$ =0.95*338 = 321 MT

References

Glazer, JP. 2018. South Coast Rock Lobster standardized CPUE indices per Area. Unpublished DAFF Scientific Working Group Document, Fisheries/2018/AUG/SWG-SCRL/02. 5pp.

Johnston, S.J and Butterworth, D.S. 2016. South Coast Rock Lobster TAC for the 2016/17 season. Unpublished DAFF Scientific Working Group Document, Fisheries/2016/AUG/SWG-SCRL/05. 3pp.